LEATHER OUR THIRD GREATEST INDUSTRY

Only Steel and Dry Goods Surpass It in Volume, Statisticians Are Ready to Prove.

PICTURESQUE OCCUPATION

At Least in the Early Days When the Tanneries Abounded in Downtown New York.

When the man in the story said that there was "nothing like leather" he was talking not only for himself but for every epoch of civilization, and further back too. The human need for protective covering first started the leather industry and probably the origin of the process of curing skins was simply cleaning and drying them. Then smoke, sour milk and various oils were found to make the leather more durable and to improve its texture. The next step was the discovery that astringent barks and vegetables permanently changed the texture of the skins and prevented decay.

Historians are not able to determine in phrases of years how far the tanning industry dates back. The ancient Egyptians knew a method of tanning for pictures on the tombs which archæologists have discovered depict it. In China experts have discovered pieces of leather in company with other relics that prove them to be more than 3,000 years old. The Romans tanned leather with oil, alum and bark. Historians state that until 1790, when the use of lime was introduced to loosen hair, there had been little improvement from the most primitive times.

In America the first tannery was built in Virginia in 1630, and a few years later a second one was established in Lynn, Mass. In the early records of Massachusetts it is recorded that fifty-one tanners had come over to the new colony before 1650. The colonists created a great demand for the labors of the imported tanners and skins accumulated so rapidly that in 1640 a law was passed that "every skin should be dried before it corrupts and sent where they can be tanned and dressed." The colonies encouraged the leather industry by passing laws forbidding the exportation of undressed leather. The result of this policy was evidenced by the growth of the industry in the early days, for by 1810 the annual output was something more than $20,000,000.

SIZE OF THE LEATHER BUSINESS.

According to the United States census for 1900 there were in this country at the close of the century 40,751 establishments devoted to various branches of leather manufacture. The amount of capital then invested was given as $173,677,421, and the annual value of the product as $204,138,127. Of this leather goods to the value of $27,293,019 were exported, while $6,773,024 worth of leather goods were imported. The leather industry has more than kept pace with the advance of this country's productions. Now it is rated the third greatest industry in America, steel is first, statisticians say; dry goods next, and the leather business occupies the third place.

In New York the district where the great tanneries were and where the leather trade flourished is still called the Swamp. It lies south of the Brooklyn Bridge and near Franklin Square. Tanning was introduced here as early as New York was settled. The early citizens of New Amsterdam wore a garb of leather, deerskin leather, and the animals that furnished it could be shot almost anywhere on Manhattan Island. When the city came into the possession of the English in 1664 some tanner came here from London and introduced the apprentice system. Boys were indentured at the age of 14 years and seven years was their term of service. The tanners made their leather into shoes. The trades were first separated at the time of the Revolution.

Adriason and Christopher Van Lear got the first patent in 1669 which was granted to them for a "mill to grind or rasp the rind of the bark of oaks to be used in tanning." Hemlock tanning was not then known. There was one tannery in Brooklyn, but the rest were in New York near the present corner of Broad and Beaver streets. The first tanner, according to the records, to set up his business at that corner was Current Ten Eyck, who located there in 1653. At the time of the English occupation the tanners were ordered to move out of the city wall, then at Wall street, and they continued their business near Maiden lane.

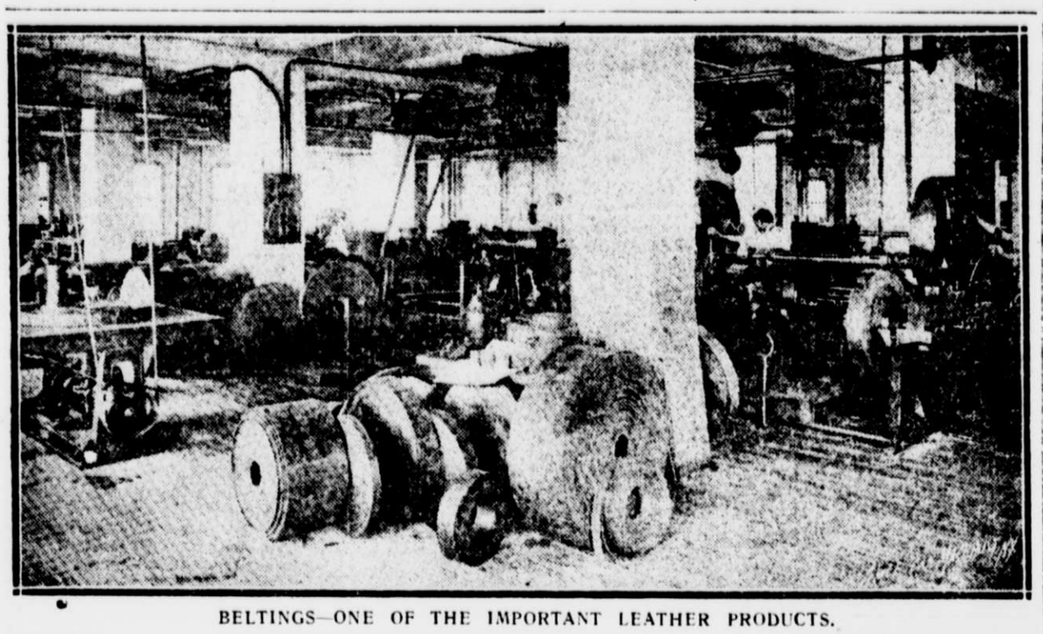
EARLY TANNING DAYS IN NEW YORK.

Shoemakers' Pasture, now one of the centres in lower New York, was bought by five tanners in 1689 and after that tract had been divided up and sold they settled around the lake on Centre street where the Tombs prison now stands. This lake was famous as the pond where Robert Fulton experimented and propelled on its surface a small boat before his trip up the North River with the Clermont. In the early days only the upper leather was tanned here and it was considered necessary for the hides to lie in the vats for a year. Sole leather was imported from London. In 1786 Gov. Moore sent a communication to the Lords of Trade in London stating that the "tanning of leather has been carried on here (in New York) for many years. Leather is greatly inferior in quality to that made in Europe and the tanners have not yet arrived at the perfection of making sole leather."

But the tanners did not stay long near the lake, Collect Pond, near Centre street. In 1790 they began to cluster about the Swamp. George Washington, having taken the oath of office as first President of the United States in 1793 on the spot where his statue now stands in Wall street, took up his official residence at 3 Cherry street and remained there until Philadelphia was chosen as the capital. Those who visited the Executive Mansion passed the Swamp and could see the tanneries with their vats stretched out in parallel rows. To some of those who came to confer with the General it was no new sight. Gen. William Sutton of Salem, Mass., owned a tannery. Col. Oliver Spencer and Col. Matthias Ogden of Newark were tanners. Gen. Alexander H. Read owned a tannery at Wardsboro, Vt. Col. Joan Mansfield, who commanded the Lynn and Salem Regiment at Bunker Hill, worked as a Lynn shoemaker, and Roger Sherman of Connecticut and Francis Lewis of New York, signers of the Declaration of Independence, were connected with the leather industry.

"THE SWAMP," WHICH WE HAVE STILL.

The Swamp where the tanneries were was a favorite playground for the boys. They built forts of spent tanbark and received the attacks of the boys who came from "Fly Market"—now City Hall Park.



BELTINGS—ONE OF THE IMPORTANT LEATHER PRODUCTS.

HIDES TANNED AND READY FOR SHIPMENT.

Before the year 1800 the tanners who did business in the Swamp sold their products to dealers on the west side, who in turn supplied the shoemakers. The methods of the tanners were not intricate. The leather was taken out when half tanned, rubbed over a beam with a stick and then shaved down to the required thickness. The shavings were thrown away or shoveled into the creek that emptied into the East River. The tanners then finished sole leather by rolling a smooth grindstone over it. The foremost leather dealers soon became leaders in politics and had their headquarters at Washington and Tammany halls.

The dealings of the merchants were on a small scale. They had close relations with the oak and leather tanners in Baltimore and Philadelphia. They brought leather here in sailing packets. In Massachusetts there were tanneries where hemlock bark was used and sole leather made. Most of that product was sold in Massachusetts and little of it reached New York. The first hemlock sole leather tannery in this State was at Hunter. Its capacity was 5,000 hides each year. As years went by a change forced itself upon the leather merchants. A line was drawn between the manufacturer and the jobber. It was no longer a matter of buying and selling hides, leather and oil. It was buying hides and selling leather.

One of the interesting streets of the Swamp district is Frankfort street. All the first tanneries were constructed in it and many who were in business there lived over their shops. The street was laid out in 1725 as far as Vandewater and cut through to Pearl street in 1800. It was the northernmost boundary of the Swamp. Franbis Lewis was one of the leading leather merchants there. He came from Wales in 1735 and had his home at Frankfort and William streets. In his trips for furs and buckskins he frequently went far into the interior of the State and was at Oswego when it surrendered to Gen. Montcalm. Every one then taken prisoner was surrounded by the Indians except Lewis. It is said that he spoke Welsh to them and that the Indians thought it was so nearly like their own language that they recognized him as being of their nationality. Lewis survived the massacre at Oswego and in 1775 retired from business. A fashionable shoemaker of New York before and for some years after the Revolution was Anthony Bolton, whose shop and home were at 13 Frankfort street. The Swamp church on Frankfort street near Vandewater street was for many years a landmark. During the Revolution it was occupied by the British troops. Horace Greeley lived in Frankfort street when he was editor of the *New Yorker*.

Cliff street in the Swamp district was originally called Skinner street because it was the place where butchers offered hides and skins for sale. The street was extended in 1740 by cutting through from Ferry to Frankfort street. The first public reading room in America was in Gold street and was established by Adrien Van Hook, the owner of a tanyard. The *Farmers Weekly Museum* of January 7, 1799, says: "It was sufficiently encouraged during his (Van Hook's) lifetime, but upon his fortunate decease was closed, to the regret of the lovers of literature."

WHEN JAY GOULD FOUGHT FOR A TANNERY.

An interesting episode in the leather trade was Jay Gould's battle for a tannery in 1860. The firm of Charles M. Leupp & Co. entered into a disastrous speculation in 1859. Zadock Pratt and Jay Gould were associated in the tanning business under the firm name of Pratt & Gould. They built a tannery at Gouldsboro, Pa. Corse & Pratt of New York stocked it. They became dissatisfied and urged Zadock Pratt to sell out. He sold it to Charles M. Leupp for about $150,000. The new owners filled the tannery with hides and accepted Jay Gould's notes for them until they were involved to an alarming extent. Leupp shot himself after he had lost nearly all his property. D. Williamson Lee, surviving partner of Charles M. Leupp & Co., went to Gouldsboro and took possession of the tannery there, leaving twenty men in charge. Jay Gould, who claimed the tannery, gathered a force of 200 men to dispossess Lee. They met at the tavern on the morning of March 6, and, after eating something rushed down to the tannery firing pistols and charged through the leather lofts, driving the Lee guard before them. Four men were wounded but none killed. The matter was afterward settled in court.

As the leather business proved profitable many tanners sent their sons to New York to learn its financial side. Until the railroad was built to Albany no leather came to New York after the North River was frozen up in the winter. Many famous tanners passed through the Swamp district, and as the land became more valuable the tanneries were moved to other districts and then to other States. But the name Swamp still lingers and many great leather firms still have their offices there.

There is nothing attractive about a tannery except, perhaps, its location, which may be in a wooded section of the country. "Pictures of our tanneries would not be of much interest," said an officer of a big leather company. "They would only show wooden buildings of a more or less temporary character."

The bark of each variety of oak is especially adapted to some particular grade of leather, and for belt leather the best bark is that of the rock oak which grows in vast forests upon the boundary line of Tennessee and Virginia and stretching far away into the mountains of North Carolina.

In the town of Bristol, Tenn., located in the Holston Valley, 1,800 feet above sea level, surrounded by the Holston Mountains, is a large tannery. In early spring during the bark peeling season, when the sap has just begun to flow, long lines of picturesque carts stream to this tannery, drawn by oxen, mules or horses in oddly assorted teams and bearing the rich oak bark which has been stripped from the trees by hardy mountaineers, and which is now stored in huge sheds to be dried and seasoned for use during the year.

HOW THE WORK IS DONE.

With the bark and hides at hand the process of tanning is begun. The hides are first soaked in pure spring water until all the dirt is thoroughly washed out of them. Then they are placed in a vat of weak lime water, which is gradually strengthened until the sixth day, when the hair has been loosened sufficiently to allow the skin to be laid on a beam and scraped off with a blunt knife. The hides are then placed in an alkaline solution for the purpose of removing the lime. This alkaline preparation is called "bate."

Cleansed from hair, flesh and lime, the hides are taken from the "bate" to the "handlers," where they receive their first bath of weak tanning liquor.

The preparation of this liquor is from the bark which had been stored in the sheds.

Ten years ago this bark was ground in something like an overgrown coffee mill, but in accord with the progressive policy which is apparent in every department of the tanning business the tannery mentioned has been equipped for the last five years with an improved crushing machine which does the work quicker and more effectively and as the crushed bark leaves this machine it is blown through large metal pipes to the leach vats by a rotary fan.

The leach tubs are twelve feet in diameter and eight feet deep and hold about eight tons of ground bark. To this bark moisture is applied. The water filters through the mass and carries with it the tannic acid.

There is a false bottom to each leaching tub, and the liquid is collected there and pumped away to the storing and supply tanks for use when needed.

It is from these tanks that the liquor is drawn for the handier vats in which the hides are put after the "liming" and "bating."

The hides are placed in these vats across sticks side by side, packed as closely as possible, and are left here for about ten or twelve days, during which the hide swells up, opening the pores of the hides and increasing both their thickness and firmness.

When the hides are taken from these handier vats portions are trimmed off and tanned separately for shoe purposes. The butt portions intended for belting are then stowed in vats called "layaways."

Here they are laid flat, one on top of the other, about a hundred in each vat; loose bark is spread between the layers and they are covered with strong tanning liquor. Hides intended for belting are given five successive layers or treatments of bark. The first layer remains ten days and the process is graded up to forty days for the last layer. In this way the best oak tanned belt leather is submitted, makers state, to a tanning which takes 120 days for the attainment of the best results. When the hides have been thoroughly tanned they are taken from the vats, washed to remove every particle of tanbark, and then oiled on the grain side. They are then hung, if they are intended for machinery belting, in a dry darkened loft, where they are kept at an even temperature with very little heat.

DISCOVERY OF CHROME TANNING.

The treatment of leather varies with the purpose it is intended to serve. Undressed leather, after it is tanned, needs simply to be rendered smooth and compact, which is accomplished by scouring and compressing the surface. Dressed leathers must in addition be "stuffed" with oils to increase their resistance to water and their flexibility; they must frequently be dyed or stained in black or colors or "grained." These processes are also performed by machinery.

The discovery that skins might be tanned by the use of chromium compounds instead of the older tanning materials came in 1856 through a German scientist and meant a revolution in the leather industry. Chrome tanning consumes only a few hours, compared to weeks with the other process. Its introduction into Philadelphia is accredited to Robert H. Foerderer. Previous to a quarter of a century ago French kids were most worn; they chipped and were not considered satisfactory. Foerderer coined the term "vici kid," it is said, which has since become so widely known. He made a great deal of money.

"The present leather situation is a peculiar one," said a leather expert, "prices are being forced up. A year ago oak sole leather sold for 32 cents. Now it is 38 cents a pound, while hides cost from 3 to 4 cents more than they did then. The sources of the supply of leather are changing. Years ago when the industry was young it was simply a matter of arranging with a farmer or abattoir for a supply of skins. Now the farmers' kill is constantly diminishing and the main source of hides is becoming concentrated in the hands of the packers.

"And as far as the packers are concerned they form another factor. In 1907 with a depression of other things the price of hides went down. Some of the packers were not willing to dispose of their hides at current prices and decided that they would tan them themselves. The next year there was a boom and the packers did so well with their tanneries that they have continued them.

"There does not seem to be much difference in the price of shoes even with the duty off hides. When the persons who are interested in having the duty off made their plea they were sure that shoes and leather goods of all sorts would be cheaper, but they haven't been, and the explanation, I suppose, is that there are more people who wear shoes and fewer cattle to get the skins from."

The Flight of a Honey Bee.

From the Indianapolis News.

George S. Demuth, now with the United States Department of Agriculture, but until recently at the head of the apiary department in the office of the State entomologist, tells of proof he has of the great speed attained by honey bees in their flight. Mr. Demuth was shipping some bees from Terre Haute to Indianapolis in a special traction car, when a few of the bees escaped from the boxes in which they were being transported.

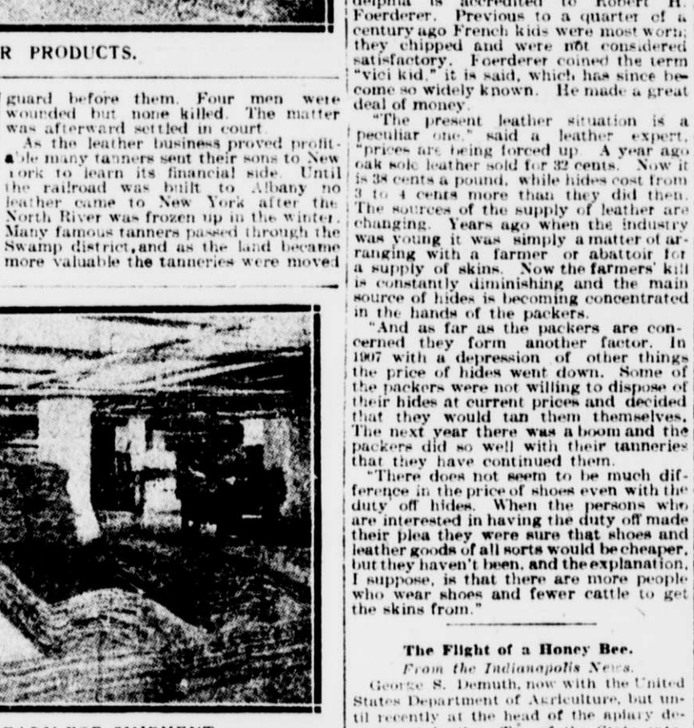
"When the bees escaped," said Mr. Demuth, "I watched their behavior and was surprised to find they had no difficulty in flying out at the open car door and flying ahead of the moving car. The car was going at the rate of thirty-five or forty miles an hour. In my opinion the flight of a honey bee must exceed the speed of the average railway train."

Whale Meat as Chicken Feed.

From the Lewiston Journal.

Now they are feeding that whale to the Eastport chickens with wonderful results. The flesh of the whale is very much like ordinary beef in texture and appearance.

The poultry men maintain that it is the best and most economical egg producing food that they can buy, because it is really very nutritious, rich in oil, free from bone and practically fresh owing to the intense cold of the past few weeks.



WHERE THE LEATHER IS CLEANED AFTER TANNING.

ONE OF THE TANNING ROOMS.

LEATHER THAT WILL BE MADE INTO BELTINGS.

STRUCTURAL STEEL IS OUR SALVATION

New York as It Is To-day Would Be Impossible Without Its Constant Employment.

THE NICETIES OF ITS USE

Nothing Equals It for Speed in Erection or Convenience, or Safety and Satisfaction.

The part that structural steel plays in modern life is very great. Without it the tall buildings which make New York preeminent and her sky line the wonder of every approaching tourist could not exist. The bridges which span the rivers about Manhattan Island owe their existence to structural steel.

A glance at the great beams which are daily carted through the streets with the half dozen pairs of horses required to draw them gives some notion of the vast quantity of the metal which is daily consumed in this city's growth. Thousands of tons of structural steel are put in place every day.

The use of steel construction in the erection of large buildings is the natural consequence of the conditions imposed upon owners of property lying within large cities and of the introduction of new materials and devices.

The form and height of buildings have always been controlled by a practical consideration of their value for personal use or rental. The cost of buildings of the same class and finish is in direct proportion to their cubic contents, and each cubic foot constucted is commercially unprofitable which does not do its part in paying interest on the capital invested. Until the latter half of the nineteenth century these considerations practically limited the height of buildings on city streets to five or six stories.

The manufacture of the wrought iron "I" beam in 1855 made cheaper fireproof construction possible. The practical limit of height was reached when the sectional area of the masonry of the piers of the exterior walls in the lower story had to be made so great, in order to support safely the dead load of the walls and floors, as to affect seriously the value of the lower stories on account of the loss of light and floor space. This limit was found to be about ten stories. Various devices were made successively to reduce the size of the exterior piers. In 1881 the walls of a very large courtyard were constructed by building a braced cage of iron and filling the panels with masonry, a system of construction that had been used in the early part of the century for a tall shot tower erected in this city. Several large buildings were later erected in which the entire weight of the floors and walls was borne by a system of metal columns placed against the inner surface of the exterior walls. The walls thus supported no load but their own weight. By the use of this form of construction buildings were carried to the height of eighteen or twenty stories.

Iron or steel as a substitute for wood for construction purposes was long thought to be fireproof, but in time it was found that iron by itself is not fireproof, but it must be protected by means of fire resisting coverings.

Buildings in steel are either of the "skeleton" or "cage" construction. In the former the columns and girders are built without proper or adequate interconnection and would not be able to carry the required weights without the support afforded by the walls. "Cage" construction consists of a complete and well connected framework of iron or steel capable of carrying not only the floors but the walls, roof and every other part of the building, and efficiently constructed with wind bracing devices to secure independent safety under all conditions of loading and exposure, all loads being transmitted to the ground through columns at predetermined points.

With the introduction of cheap structural steel, steel cage construction came rapidly into use. The bracing of the sestructures is accomplished by the introduction at the angles of the columns and girders of beams or knee braces, or by diagonal straps or rods attached by pin or rivet connections. All portions of the frame are united by hot rivets of mild steel or wrought iron. The greatest care is taken to see that all rivet holes are accurately punched, and if necessary that they are rhymed so that each rivet will have its full value.

At the shop the steel girders receive a coat of paint and after erection two additional coats; the first of red lead, with oxide paint for the finishing coat.

Steel construction possesses great advantage in the time required for erection. When once the site is cleared and the foundations prepared and set, work can be pushed on the walls at different stories at one and the same time. In the Commercial Cable Building, New York, seven complete tiers, aggregating 7,000 tons, were erected in nine weeks. In the Unity Building, Chicago, of seventeen stories, the metal framework from basement columns to finished roof was completed in the same length of time.

Steel construction has also made possible the wonderful bridges of the present time, with their immense spans. One of the most noted of these is the Queensboro Bridge, crossing the East River from New York to Brooklyn. This bridge is the second largest of the cantilever type in the world, being exceeded in length by the Firth of Forth Bridge, Scotland. It is estimated that the weight of the steel used in the Queensboro Bridge aggregates 50,000 tons, necessitating in its support 54,000 cubic yards of masonry in piers and foundations.

In the erection of the bridge the pieces of steel were excessively heavy. All material was floated to Blackwell's Island, upon which the centre pier was constructed, and unloaded with special sixty-five ton derricks. Eyebars were packed together and lifted as one member. All heavy members were lifted with special lifting devices. Falsework was of steel, specially designed for the erection, first of the island span, and later of the east and west anchor arms, extending to Brooklyn and New York respectively.

The erection of the steel was accomplished by two different travellers, to permit of continuity of erection. The first traveller was composed of two derricks and erected the lower floor system and half of the truss of the anchor span. The second traveller was a typical inside "Z" shaped cantilever traveller, weighing approximately 600 tons. This was necessary, as the bridge is hung in a cradle from flared columns, prohibiting an outside traveller, the height of the traveller being limited by the fact that it must go under the portal, which latter must be in place on account of the thrust in it. Therefore a large derrick had to be used on top of the traveller to raise the parts of the tower and truss above the traveller.

In one day 512 tons of steel was erected which is said by engineers to constitute a record.

TRIMMING LEATHER AND MAKING BELTINGS OF IT.

TRIMMING THE HIDES.

ONE OF THE TANNING ROOMS.

WHAT MACHINES DO FOR US.

And by Way of Illustration, the Wonders of a Shoe Factory.

"If you happen to pass by a window in the theatrical district where you see a crowd always standing, take a look and get some idea of the uses which machinery can be put to," said a manufacturer. "Who, a few years back, would have thought of having one's shoes shined automatically? But there you are. You will see a dozen people waiting to put their feet in a little slot, drop a nickel and let the wheels do the rest.

"It's only another instance of the advance which modern times have made in the matter of machinery. It is all very well to talk of the ease with which our forefathers lived. They lived a life which we would not tolerate. Imagine a woman nowadays spending hours on her knees before a blazing wood fire hauling cooked dishes out of an oldfashioned oven. It is all very pretty to think about, but it certainly was hard work and that woman in those days would have given all she had for a modern cook stove. Then take the sewing machine. Suppose all the clothing now was stitched by hand. Compare the oldfashioned way of jolting over the ground in a chilly coach with the comfort of a railroad train."

The real progress in machinery development, the man pointed out, dates only from the opening of the nineteenth century. From that time it has advanced with wonderful rapidity. To the close of the eighteenth century men had been dependent upon what might be called the natural sources of power. If they wanted additional strength to supplement their own they used other animals, such as horses or the energy of running water or the changing wind. When the steam engine became a commercial fact all this was changed. Man had found a way to transform the energy locked up in coal into mechanical force and use it for his purposes. In the coal was stored up the sunlight of centuries. Man harnessed the sun and made it work for his interests.

The application of machinery to the uses of every day existence has produced epochal changes. Take its relation to shoemaking. Before the introduction of machinery the cobbler was obliged to sit at his "last" and make every part of the shoe—or boot more commonly in those days—himself. The next step was to buy the uppers ready made from a factory. Then came the factory system which now obtains everywhere.

The first thing a shoe manufacturer has to do is obtain the leather that he uses in his work. It takes great quantities of leather to furnish the material which is daily required in a great shoe concern. In the stock one finds calfskins, goatskins and the ordinary cowhide. China, India, South America and South Africa each furnishes a quota of the hides.

In the department where the uppers are put together are hundreds of sewing machines and each is driven by a power belt. The machines which sew on the buttons are an interesting invention. Another set of machines makes the buttonholes. The old cobbler was obliged to punch holes in the leather, place each hook in its proper place and clinch it. The machine does all this automaticaly and never gets one put on the wrong way. A similar device fixes the eyelets.

While the machines which turn out the "uppers" have been busy there are other sets of machines which prepare the lower part of the shoe. Heavier machines cut out the soles and heels. These are graded in power and arrangement of parts according to the grade of shoes to be put out. The heavy ones, to make shoes for carters and miners, are arranged with devices which fix the soles on the upper by means of screws or nails.

In the mechanism for preparing the higher grade shoes there are arms which pull the uppers down and hold them in place while the sewing takes place. A later process is the heeling. The heels are built up of numerous layers of leather. One machine compresses the heel and gives the top a hollow shape in which the wearer's heel rests, then it is automatically nailed fast. The final step is the polishing, which is done by automatic burnishers.

A Penguin Wedding.

From the London Daily News.

Dr. Charcot devoted a section of his lecture on Antarctic experiences to the amusing antics of the penguins, which he said were very much like human beings in their behavior.

Sometimes a couple of betrothed penguins could be seen seated close together in loverlike fashion in a recess formed by blocks of ice and observation had shown that subsequently the same couple attended before a third penguin, who might be called the clergyman or the registrar, for the positions of all three were similar to those occupied by the minister and the bride and the bridegroom at a wedding.